Contribution ID: **22**   Type: **not specified**

Certified many-body physics

Thursday 2 October 2025 10:50 (40 minutes)

When studying many-body systems, two approaches have been considered so far: analytical derivations and variational methods. The first provide exact results, as they do not involve any approximations, but scale exponentially with the number of particles, while the second scale much better but only provide estimates with no theoretical guarantees. Polynomial optimisation methods offer an alternative approach somehow combining the advantage of exact and variational methods: it provides rigorous results, now in the form of upper and lower bounds, in a scalable way. We illustrate this new approach in two paradigmatic many-body problems: the estimation of expectation values in ground states of Hamiltonian operators and in steady states of quantum open systems.

Presenter: ACIN, Antonio

Session Classification: Keynote Speakers